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The Spaniards with Gonzalez (90, p. 90), who anchored off the north coast, judged the soil of the island to be fertile. "The country inland . . . appeared to us to be fertile, as we observed no broken ground, nor precipices nor stony places throughout it, but various valleys and plains forming the mountain plateaux as it were, and quite covered with greenery as far down as the sea-beach, showing the fertility of the country." After a more intimate knowledge of the island, the Spaniards declare: "The fields are uncultivated save some small plots of ground, in which they sow beds of yucca, yams, sweet potatoes, and several plantations of plantains and sugar cane: but all very tasteless, as if from want of cultivation." Gonzalez's officer, who went around the island in a launch, noted in his report (90, p. 121) that the Hanga-roa Bay area had more gardens than any other part of the island.

Cook and Forster are largely responsible for the impression of desolation created about Easter Island. Even before landing, G. Forster (83, vol. 1, pp. 556-559) was struck by the barrenness of the island; he noticed from the ship only a few plantations to the north of present Hanga-roa. When ashore, he visited at Hanga-roa Bay some plantations of bananas, sugar cane, yams, sweet potatoes, and taro.

The expedition sent by Cook to explore the interior of the island went from Vaihu across "a number of plantations of bananas, potatoes and yams, and one of eddoes" (53, vol. 1, p. 587). Between Vaihu and Hanga-nui, they proceeded inland where they found "many remaining proofs of its having been formerly cultivated." Between Hanga-roa and Vinapu they saw "several large tracts planted with potatoes and some plantain walks." The slopes of Rano-aroi seem to have been completely void of cultivation (53, vol. 1, p. 281). J. R. Forster (84, p. 155) "found the whole island very poor in vegetables; and though I walked over a great part of it, I found no more than about twenty plants, including those that are cultivated, and no trees at all, which is very remarkable on an isle of this extent, under so fine a climate, and inhabited for a long time past." Cook (53, vol. 1, p. 282) reports of this reconnoitering party that "for about three miles [doubtless from Vinapu] they found the country very barren, and in some places strips of the soil to be bare rock which seemed to be a poor sort of iron ore. Beyond this, they came to the most fertile part of the island they saw, it being inspersed with plantations of potatoes, sugar-cane and plantain trees, and these not so much encumbered with stones as those which they had seen before."

La Pérouse (130, vol. 1, p. 71) estimates that one tenth of the surface of the island was cultivated, and he is convinced that three work days were "sufficient to procure the Indian subsistence for a year." De Langle, naturalist of La Pérouse's expedition, followed more or less the same itinerary as Forster and makes a similar report. Rollin, who also accompanied La Pérouse, gives

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a description of the country which seems to be accurate (130, vol. 2, p. 238): "The aspect of Easter Island is not so barren and disgusting as navigators have told us. It is indeed almost destitute of wood, but the hills and valleys exhibit, in the eyes of seamen at least, a most agreeable verdure. The size and goodness of their potatoes, yams, sugar canes, etc. are proofs of great fertility and strong vegetation."

Contrary to their predecessors, the travelers of the nineteenth century who saw Easter Island were impressed by its apparent fertility and the richness of its plantations. Delano (5, p. 356) says of the west coast in the year 1804: "The greatest part of the island had the appearance of being capable of cultivations, and much of it was cultivated in beautiful plantations." Lisiansky (143, pp. 52-54) finds that "the eastern part of Easter Island is very pleasant. It is covered with verdure and many spots of it appeared to be planted with bananas. . . The neighborhood of the last two mentioned monuments (Vinapu) contained a greater number of habitations, and seemed better cultivated than any other spot we had yet seen. . . . The northern side appeared to be but thinly inhabited." Choris (48, p. 11) writes in 1822: "The aspect of the island was rather arid, but it appeared to us less miserable than to Cook or La Pérouse. All the higher slopes were divided in fields planted with various vegetables, whose varied nuances produced a very pleasant effect." Beechey (15, pp. 41-42) observes that the valleys were well cultivated and that the greatest attention appeared to be paid to tilling the soil. Palmer (169, p. 374) had the impression that everything was in ruins, though there were evidences of former cultivation.

In spite of Roussel's judgment (190, p. 495) to the contrary, Easter Island is fertile. Skottsberg (208, vol. 2, p. 488), our best authority on the subject, states that "where there is sufficient soil this is of good quality and quite fertile when properly cultivated, and in prehistoric and early historic times extensive plantations existed supporting a population of several thousands."

The present-day population of 456 souls is concentrated in the village of Hanga-roa. They cultivate the neighboring fields at the foot of Rano-kao and Rano-aroi. According to Mr. Edmunds, former manager of the island, two acres are necessary to support a whole family, and I am convinced that his statement is correct.

It is important to determine, as far as possible, the extent of cultivable land on Easter Island, for on this may be based an estimate of the number of inhabitants and in turn the probability that they could accomplish such a huge project as the carving of the famous statues. From a study of reports of ancient travelers and from my own observations of the island resources, I am convinced that three or four thousand natives could live on the island without fear of hunger except in time of war.

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The steady decrease in the population culminated in 1871 when most of the natives left for Tahiti and Mangareva. The exact number of those who abandoned their homes that year is difficult to ascertain. Jaussen (113, p. 385) says that 231 Easter Islanders were working on Brander's plantations and that 50 (some other sources say about 100) stayed in Mangareva with the missionaries. By 1873, 100 of the 231 had died. The number of the emigrants to Tahiti estimated by Thomson (215, p. 461) and Geiseler (87, p. 19) as 400 or 500 is certainly exaggerated, since they say that 300 or 400 were also transferred to Mangareva. In 1900 the Easter Islanders in Tahiti were only 44—21 men, 11 women, and 13 children (7, p. 84). I do not know the present number.

The following table tabulates all available population figures for the period 1872 to 1934. This includes inaccurate estimates made by missionaries and visitors as well as careful censuses.

The present population is concentrated in the village of Hanga-roa and occupies 2,000 hectares. This area, granted to the natives by the government, is small but sufficient for their needs. Only the fields in and around Hanga-roa are cultivated but the need of more land has never been felt. It might even be said that the natives could produce far beyond their wants if they cared to. If 456 natives can live easily on a small portion of the island which is not particularly fertile it may be assumed that eight or nine times that number could have made a comfortable living on the entire island. Formerly fishing was a more important food resource than it is now. I believe that the population of Easter Island a hundred years ago must have been between 3,000 and 4,000. Meyer and Jablonowski (160, p. 6), who have investigated carefully the population of Easter Island, propose the same figure. If the population was about 3,000 before the coming of the white men it gives a density of 13.7 persons to one square kilometer, about the same number as that for Tahiti.

Leprosy is the only disease endemic to the island. In 1934 there were 22 lepers confined in a separate hut. During the five months we spent on the island all the other natives were examined by Dr. Drapkin who found them in excellent health, with the exception of a few cases of tuberculosis. Venereal diseases are rare and only three or four cases of blennorrhea have been reported. Natives are very susceptible to pulmonary infection. The visit of any boat is invariably followed by an epidemic of influenza or bronchitis. Although surgeons of a warship inspect the island at intervals the natives were vaccinated for the first time during our stay on the island.

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his visit, but he gave a good description of the north coast, especially of the bay of Hangoteo.

In 1822 the skipper of an American whaling ship paused at Easter Island long enough to kidnap a group of girls who were thrown overboard the following day and obliged to swim back to the island when they left the ship. One of the officers, simply for amusement, shot a native with his gun (162, vol. 2, p. 279).

At a session of the Royal Geographical Society (172, vol. 14, p. 117) Mr. P. P. Blyth reported that he visited Easter Island in 1826.

Moerenhout (162, vol. 1, pp. 23-28) passed Easter Island on one of his voyages from South America to Tahiti. A native boarded the ship and invited the sailors to go ashore, alluding to the charms of the women. Moerenhout was told by other captains that the Easter Islanders made "shameful commerce" of their women and that venereal diseases were common among them. This statement indicates that the natives had already had more contact with white men, probably with whalers, than might be deduced from recorded visits.

A manuscript letter written by H. Cuming to Dr. Hooker (dated London, March 21, 1832) reveals that in 1831 the island was visited by the schooner *Discoverer*. Since the document is still unpublished it is of interest to reproduce the passage concerning Easter Island:

> On the 28th arrived at Easter Island and lay to all the day. Number of the natives came on board; were a lively good natured race, rather inclined to take anything portable but free to give for the merest trifle. Supplied us with Plantains, Yams, Sweet Potatoes and a Root called Cocos in the West Indies. Could not procure any botanical specimens from fear of the numerous inhabitants who lined the shore. Could not discover anything larger than the Plantain and that was not high. The sides of the hills were extremely well cultivated, laid out in squares and in great number together.

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Admiral du Petit-Thouars (65, vol. 2, pp. 222-234) sailed along the coast of Easter Island (1838). Several native men and women, who swam to the ship, performed a dance on board. They tried to steal, and some suggested that the crew go ashore where they would find an abundance of food and women.

The visit of the English frigate *Portland* (1852) is known only by the brief allusion of Palmer (171, p. 169) in his address to the Royal Geographical Society in which he mentions some ethnographical observations made by the officers of the ship.

In 1856, The Friend, a journal published in Honolulu, printed a letter from James Hamilton, master of the bark *Prudence*, who lost one man in a fight with the Easter Islanders. He made an attempt to trade with the natives, but they capsized the boat which went ashore, and tried to take the clothes of the crew. The second officer was killed and the boat steersman taken Ashore but rescued the second day.

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After their wedding nights both suffered from cruel pains in the stomachs and would have died if they had not applied to Pakarati, the catechist, who saved their lives by prayer and other ritual performances. This belief is perhaps the survival of an ancient tapu against marriages between female members of the *ariki* group and common members of other *mata*. However, Routledge (194, p. 246) affirms that unions between *ariki-paka* and commoners were possible in the old days, for the daughter of the great king Nga-ara is said to have married a man of the Marama tribe. It is certain that the king had to marry in his own tribe, though not in his own lineage. Other men of the Miru could marry into any descent line.

Certain physical peculiarities were attributed to the members of the different tribes. Thus the Tupa-hotu were said to have tender feet which easily became sore in war expeditions. The Miru were bow-legged (*ngapau*).

Geographical Distribution of Tribes

Ruins of houses and ahus scattered over Easter Island correspond to the distribution of the ancient population. All villages were concentrated along the coast and the mountains and plains of the interior were sparsely inhabited. On the slope of Rano-aroi, near Vai-tea, the remains of two or three ahus may still be seen. Another ahu is a little north of Mount Oroi. On the west of the island were some villages and ahus built at the base of the slopes of Rano-aroi and at some distance from the coast. The settlements belonged to the Miru and the Hamea. Some Marama were scattered farther toward the interior. All the ancient settlements east of Vai-tea had been founded by families from groups in the east. As testified by the scarcity and the relative unimportance of the ruins, the groups living in the interior were isolated and composed of only a few members.

The ten *mata* or tribes were divided into two main divisions corresponding roughly to the western and eastern parts of the island. The western and northwestern tribes were called Tuu (usually spelled Ko Tuu) or *mata nui* (greater groups), and the eastern tribes were the people of Hotu-iti or *mata iti* (lesser groups). The reason for this dualism is not clear. There is no tradition or fact suggesting that the splitting of the *mata* into two main divisions had a social function and it is probable that it was a political institution. It was manifest mainly in a perpetual antagonism between the groups, the memory of which has been preserved in legends (p. 74). It is important to stress the fact that the tribes of the eastern division are more frequently mentioned under the collective name of Hotu-iti that the tribes of the west are under the name Tuu. Thus it may be inferred that the eastern tribes were more unified than the western ones. The above data implies that Hotu-iti was a primary tribe which divided into smaller groups. Tuu seems to be a simple geographic designation. Near Hanga-roa on the west coast there is

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a mountain called Tuu which may have some connection with the general name of the western groups.

Dual division was correlated with certain aspects of the religious ceremonies. For instance the servants (*hopu*) who stayed on the island of Motu-nui awaiting the first eggs of the tern (*manu-tara*) were grouped according to the region from which they came (p. 335). The island Motu-nui was divided into two sections by a line passing through the center of a cave where the contestants lived and, according to Routledge (194, p. 261), " . . . also through another cave nearer the edge of the islet; in this latter there was at one time a statue about two feet high and known as Tita-hanga-o-te-henua, or the Boundary of the Land." The dual division of the groups was also observed at the stone village of Orongo where, to quote Routledge (194, p. 260), " . . . the group of houses at the end among the cave rocks was taboo during the festival, for they were inhabited by the rongo-rongo men, the western half being apportioned to the experts from Hotu-iti, the eastern to those from Ko Tuu." This dualism can be interpreted in the light of conditions prevailing on other islands. Hotu-iti and Tuu were probably two antagonistic confederations of tribes fighting for hegemony of the entire island.

The eastern headland, Poike, was not included in any district. That region is entirely barren and only three ahus were built on its edges—one at the foot of Mount Teatea, another on the eastern slope of Mount Puakatiki, and another facing the island Marotiri. The burial places were erected by Ureohei and Tupa-hotu people. The southwestern point of the island with its volcano, Rano-kao, was also outside of the districts, though some Marama, Haumoana, and Miru families lived near the present Mataveri and by the Ahu-rikiriki on the southern slope of the volcano.

The Miru were the most widely distributed of the *mata*, and families or representatives of the Miru lived in the districts of Marama and Haumoana, near the village of Hanga-roa and the bay of Hanga-piko, and on the slopes of Rano-kao near Mataveri. The Hamea and Raa groups are always mentioned together and are represented as being closely associated with the Miru in whose district they lived. They had no territory of their own. The Marama occupied a long strip of land from the west coast to the south coast. They are frequently mentioned with the names of certain important places where they were numerous. They are spoken of as the Marama of Tahai, the Marama of Vaihu, the Marama of Hanga-roa. The district given by Hotu-matua to his son Marama does not coincide exactly with the distribution of the Marama tribe. It includes the territory of the Ngaure, the Ngatimo, and a part of the Haumoana, but it does not extend to the west coast through the interior of the land. The Haumoana, like the Marama, extended from the southern coast to the western coast. Haumoana people are mentioned east of their boundary, settled in the district of the Ngatimo. The Ngatimo group was concentrated in a very short section of the south coast where fishing was unfavorable. However, Ngatimo families occupied the shore from Vinapu to Vaihu. The Ngaure were natives of Akahanga cove, but their real location overlapped their district, and some of them lived to the east of their land. The Tupa-hotu, Ureohei (Hitiuira), and Koro-

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children were rarely admitted to such feasts. Zumbohm (230, vol. 6, p. 241) was told by natives that the fingers and toes were the most palatable bits.

Cannibalism was closely associated with war; the victors feasted on the corpses of the defeated and killed prisoners to be eaten. Geiseler (87, p. 30) says that "when they had many captives, they shut them in huts erected for that purpose in front of the stone idols. They were kept there until a great feast was celebrated for the victory and food consumed in abundance. On occasion of these feasts the victims were killed in honor of the gods." Legends tell of grown persons and children who were slaughtered during peace time by warriors craving human flesh. (See 215, p. 427; 230, vol. 6, p. 241.) These acts were deeply resented by the relatives of the victims who took cruel revenge for the crime, which was considered a terrible insult to the family.

Traditional history frequently alludes to cannibalism. The long war between the Tuu and Hotu-iti districts was indirectly caused by two men who craved human flesh (p. 74). When Tuu was victorious and the Hotu-iti people were crowded on Marotiri, the victorious party organized regular raids to kill them. The corpses were taken back in canoes and distributed among the warriors to be eaten. A quarrel about a corpse precipitated the final defeat of the Tuu district. The Hotu-iti men besieged in the caves celebrated their victory by eating some of the enemies they had slain in their successful attack. Other tales show that some individuals did not hesitate to commit murder to satisfy their appetites.

AGRICULTURE AND COOKING

GROUND CULTIVATION

It is difficult to estimate the extent of cultivated ground in ancient times. Certainly the peninsula of Poike was as desolate in pre-European times as it is today, with the possible exception of the land near the three hills where some water was available. The interior of the island was apparently always sparsely inhabited. Evidences of ancient agriculture in the form of enclosures of varying sizes are found scattered over the island, generally near old ahus. According to natives, some of these enclosures were built after European contact to protect the crops from voracious sheep and goats. This statement must be true for material from ancient monuments has been used in their construction. The extent of ground so protected is not great, but if one considers the number of enclosures and the fact that many were built when the population was decreasing, it is evident that the natives took an interest in the cultivation of the soil which must not be underestimated.

Knoche, who paid some attention to the agriculture of Easter Island seems to have had a poor opinion of the native plantations of his time (1912). He